TWO CASES OF

TUMOUR OF THE BRAIN CONTRASTED.

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A. E., æt. 62 on first admission in March 1872. First attack of insanity, which had been of short duration previous to admission. Her hereditary history unknown, and the exact course of her attack also unrecorded. On admission, she laboured under an attack of subacute maniacal excitement, with loss of memory, incessant incoherent talking, and changing delusions as to being turned inside out. She was looked on as a case of senile mania. There were no paralytic symptoms noticed. This excitement soon passed off, and she was discharged recovered in six weeks after admission.

She kept pretty well for a year, when she was admitted again (March 1873), labouring under the same kind of excitement as before, but in a rather more acute form. She was more restless, quite delirious, and incoherent, and fancied that every one was begging from her. She was dirty in her habits for a time, but there was no evidence of motor paralysis or evident organic disease of the brain on admission.

She soon settled down into a quiet, slightly demented old woman, who could or would not employ herself in any way. She had no delusions of any kind. For the next six months she was subject to slight transient attacks of excitement of a few days' duration, appearing to get weaker in mind after each attack. She was not specially irritable during or between the attacks. About that time—that is, about eighteen months after the first attack of mental excitement—it was noticed that she was slightly hemiplegic on the right side after one of her attacks of excitement. This rapidly passed off, but recurred over and over again, always after mental

excitement, the curious thing being that sometimes one side of the body was affected, and sometimes the other. She got steadily weaker in muscular power, fell off in flesh, and became more forgetful and demented, though when roused by questions she would answer coherently, until, in three months from the time she had the first attack of hemiplegia, she was almost constantly confined to bed. She lingered on, however, for another year, being up to within three months of her death subject to the attacks of excitement, which latterly consisted simply in her being restless and apt to come out of bed for about a day at a time. When the hemiplegic attacks came on she could not speak, her tongue and labial, as well as her facial, muscles being paralyzed on one side. Towards her death both sides of the body were permanently paralyzed, but the left more so than the right. There was never any tendency to permanent contraction of the muscles in any part of the body. She was wet and dirty in her habits, but never had any tendency to bed-sores. She never lost her sight, and she spoke slowly, like an old person. She lingered at the end for months after she was expected to die, not being able to articulate at all for the last six weeks of her life. She always ate well, digested well, and was regular in her bowels, up to near her end. She died of sheer exhaustion, without any convulsion, on the 5th April 1875, three years after her first mental attack, and eighteen months after the first attack of hemiplegia.

Post-mortem Examination.—The body was very much attenuated indeed. *Head.*—Skull-cap slightly unsymmetrical, right side bulging. The dura mater had an opening in it about three-quarters of an inch in diameter, in the middle of the frontal region, through which part of a tumour projected. On removing this membrane, this tumour was found slightly attached to it, and embedded in the brain between the two hemispheres, but projecting much more into the left than the right anterior lobe. This tumour was scarcely adherent to the brain at all, but had pushed the cerebral structure out of its way; and the convolutions in contact with it were not apparently softened, and not much atrophied. It was almost globular in shape, about an inch and a half in diameter, and in consistence fleshy rather than fibrous. On section it was found to be of a grayish-white colour, easily lacerable, and showed a slight tendency to break down in the centre.

Near the tumour the dura mater, pia mater, and arachnoid were slightly matted together, but they did not adhere to the brain. The tumour seemed to have originated in the pia mater; the dura mater was very much thickened, and had three thin bony plates on its inner surface, along the junction of the falx, but to the left side just behind the vertex. The largest was three-quarters of an inch in circumference.

The arteries everywhere were excessively atheromatous, their calibre enlarged and patent, those at the base very tortuous.

On section, there was great irregularity in the vascularity of different parts of the brain-substance, some parts being exeessively pale, and others very vascular. There were a great many small irregular patches of a gray absorptive degeneration throughout the corpus callosum, optic thalamus, and corpus striatum. There was considerable general atrophy of the convolutions at the vertex; the anterior pyramids of the medulla oblongata appeared somewhat flattened.

Microscopic Examination.—The tumour was found to consist of fibres and cells in about equal proportions, the cells being small, nucleated, and uniform in size. Both fibres and cells were disposed circularly round centres, the latter generally with extreme regularity in concentric rows, looking, in a large microscopic section, like an aggregation of small tumours. The centres of these concentric circles of fibres and cells seemed in some cases to be masses of nuclei, and in others very curious flattened circular bodies, with a concentric marking, very broad and coherent, and, but for their large size, very like large regularly-formed amyloid bodies. These took the staining in sections coloured by carmine, and were only seen after the section had been well cleared; but there were other curious irregular masses of granular material in the tumour which did not stain. The sections in this and the following case were made for me by Dr J. J. Brown.

The spots of "gray absorptive degeneration,"—as I have called them, because I think this term more clearly expresses their true pathological nature than any other,—on section, were found to consist chiefly of neuroglia (fibres and nuclei), compound granular bodies, and masses of hæmatoidin crystals.

J. W., æt. 25, prostitute, admitted 28th January 1874. No history, except that she was a prostitute, who was said to have wandered from Glasgow, and was apprehended by the police; but she had been earning her own livelihood up till a month of her admission; and an aunt of the patient informed me that three weeks before she was simply stupid, irritable, and melancholic. On admission she was confused and depressed-looking, but could not speak. Scarcely appeared to understand the questions put to her. Memory almost gone. She was a thin miserable-looking creature, frightfully dirty, with a vacant, confused, stupid look, who could give no account of herself. Had a black eye. Pupils unequal, right being larger than left, but both were slightly sensitive to light. Motions slow, and gait not very steady; and the left side was weaker than the right. Her tongue was foul, bowels constipated, appetite poor, pulse 70, and weak; temperature 97·8°.

It was found that she could not dress herself or comb her hair, but could feed herself. Complained at first of no pain in head, but the left side of her chest was painful and tender, so that she complained much of it when she was being dressed. When asked to do anything, such as to dress herself, said she could not do it.

The day after admission, her temperature was 100·3°; she had no appetite. She had a dazed, pained look in her face. Could answer a question or two in a hesitating way, some time after asking, as if it was long before the impression had reached her sensorium.

Two days after admission, during the night she had six very severe epileptic fits, during each of which she ground her teeth very much indeed, and kept grinding her teeth between the fits; she did not bite her tongue. On the following morning she was very stupid indeed; the pain in the left side was intense, so that she could not bear to be touched there. She could not answer or understand questions, or put out her tongue. When she got up for a few minutes out of bed to have it made, she turned round and round from right to left during the whole time till she went to bed again, though she was so weak on her legs that there seemed a danger of her falling every minute.

After this she got slowly a little better, until she got much better than on admission. She often complained of frightful headaches. She had several epileptic fits of the same character as those described, but not so severe.

When in her better way, the account she gave of her fits was that they had come on after a man had struck her on the head, shortly before coming here. She said she suffered agony in her head, that it was like to fall in two; the headache was chiefly across the brow, and was worse in the mornings.

On the night of the 23d February, she died suddenly, whether in a fit or just after one was not quite certain; but the night-attendant, who came in when she was *in articulo mortis*, did not observe any convulsion or sign of it.

Post-mortem Examination, 72 hours after death.—*Head.*—Skull-cap symmetrical and normal in structure. Dura mater slightly thickened, but not adherent. Surfaces of brain and pia mater pale, and abnormally anæmic. The convolutions were flattened-looking. Sulci shallow. On section, the brain-substance was found pale and anæmic at the vertex, but with the puncta quite distinct.

In the front part of the anterior lobes of each hemisphere, about the level of the corpus callosum, was found a tumour; that on the left side being about the size of a walnut, and that on the right about the size of a pea. Both tumours were situated near the fissure, so that they were in contact; they did not project in any way beyond the normal outline of the brain, and were embedded in both the gray and white substances of the convolutions. They did not in any way push the brain-substance aside, but seemed as if the substance of which they were composed had been deposited in the brain-substance. They were of a grayish-white colour, hard and elastic. Their substance intermixed with the gray matter of the brain, throwing roots into it, and the brain-substance running into the tumours. There was a line of red

ramollissement, and minute apoplexies in immediate contact with the morbid product, and then a considerable space of brain-substance—on the left side, extending throughout the white of the whole anterior lobe, and a lesser tract on the right side—in a state of white ramollissement; this gradually passing into healthy brain-substance. The effect of the morbid product was particularly well seen on the right side when carefully examined, on account of the process being more recent there and the deposit much smaller.

The brain-substance at the base was congested, but was otherwise normal; the arteries throughout appeared healthy.

Microscopic Examination.—Sections of the tumour or rather deposit showed that it was chiefly made up of badly-formed cells, with granular contents, without nuclei, and embedded in a dense stroma of granular matter, each granule being very distinct, and refracting light very markedly. The cells were disposed in some places in lines, and in other places in concentric layers round small vessels. Along with those cells there were many granular masses of blood-colouring matter.

The arteries in the tumour were found in all conditions, from perfect health to complete obstruction. In most cases their outer coat was much thickened, and in some cases there was an adventitious deposit round them in concentric layers. In some instances they could be distinctly seen to have their calibre obstructed by masses of granular matter, in other cases by masses of the cells I have described, while in some cases they looked as if squeezed and shut up as if by pressure from without. In some places they could be seen with wide perivascular canals, partly filled up by a granular deposit.

Where the syphilitic deposit joined the unaffected brain-substance, the white fibres could be distinctly seen running into it, getting broken up, swollen, and distended, and much mixed with compound granular cells and hæmatin deposits.

The development and different degrees of organization of the deposit could be distinctly traced. In some places, especially near the surface of the brain, it was simply granular, the granules being, in many cases, disposed concentrically round the vessels, this arrangement extending to a long distance from the coats of the vessel; then the cellular formation could be traced, the cells at first being few, very irregular, and ill-defined, and with no distinct outline. Then the cells would seem to occupy nearly all the space.

An examination of prepared sections of the brain in the parietal lobe, a considerable distance from the tumour, showed—1. Very distinct and beautiful microscopic apoplexies between the pia mater and brain; 2. A great number of compound granular cells; 3. Masses of blood-colouring matter; 4. Granular degeneration of many of the nerve cells; 5. Masses of granular matter, chiefly hæmatin, surrounding many of the small vessels; 6. Marked

thickening of the coats of many of the arterioles; 7. A great abundance of small, light-refracting granules.

Remarks.—These two cases, though very imperfect as regards their history previous to coming into the Asylum, and the symptoms, mental and bodily, that characterized the beginning of their diseases, yet are most instructive as examples: the one of chronic but steadily-advancing brain changes, all of the nature of degenerations; the other of an acute and specific disease of the organ. Both are classed as tumours of the brain, the tumour in each occupying almost the same position in the anterior lobes of the organ. Here the resemblances end, however, and the most marked differences and contrasts begin.

In the one case, we have the symptoms arising three years before death—and being mental symptoms alone for a long time—and at times so abating that they seemed to have disappeared; in the other, they showed themselves certainly within three months before death, the epileptic attacks soon followed the melancholia and cephalalgia, and their course was uninterrupted. The slowly advancing tumour in the one did not much affect the brain-structure by direct pressure, for it made a nest for itself in the convolutions, which seemed to have been just pushed aside. The syphilitic deposit in the other case, though not one-fifth the size of the tumour, on the other hand, had caused intense irritation in the brain, extending back throughout the whole anterior lobes.

In the one case, during life there had never been any tendency to convulsion; in the other, convulsive symptoms of the most severe kind were present. In the one case, there was at first only transient hemiplegia; in the other, there was, from the beginning, great and permanent weakness of all the voluntary muscles.

Mentally, the one case might have been described as one of slowly advancing dementia, with slight and transient outbursts of excitement, not very essentially different from many cases of dotage in people of that age; the other was one of melancholia and stupor, with rapidly advancing destruction of the mental faculties; reason, emotion, and memory being all affected. The second (J. W.) was a characteristic case of the "syphilomatous insanity," described by Mr H. Hayes Newington.[1]

The suddenness of death in the syphilitic case is, in my experience, a very common phenomenon in cases of tumours of the brain that grow rapidly, or have attained a large size, or cause irritation in the surrounding brain-substance. Three of the eight cases I have had under my care have died in this way.

The tendency to periodicity and intermission in the case of the slowly-advancing tumour is not to be accounted for, in my opinion, pathologically. There were no evidences of successive apoplexies.

[1] Journal of Mental Science, January 1874.

It will be remembered that she had attacks of mental excitement, followed by slight attacks of hemiplegia, first of one side of the body and then of another. It is certainly extremely difficult to explain such transient attacks of hemiplegia, but I think they may be regarded as analogous to the melancholia and mental lethargy that so often succeed an attack of mental excitement, only affecting the motor centres in the brain. It was seen after death that the corpus striatum was much affected by patches of degeneration. Now, this probably implied that its function of the chief motor centre in the brain was much interfered with. All nervous disorders are eminently remittent; and it is quite as conceivable to have remittent hemiplegia from a permanent lesion as it is to have remittent neuralgia from the same cause.

In a paper on Tumours of the Brain I published some years ago,[1] I directed attention to several pathological conditions of the brain which different kinds of tumours, growing in different ways, cause, viz., 1. "An irritation tending to ramollissement in the nerve-substance with which they are in contact;" 2. "They cause pressure on distant parts, which in its turn causes an alteration of the structure and nutrition;" and, 3. "They set up progressive disease and degeneration of certain parts of the nerve-structure, the true nature of which is as yet not very well known, but it seems to be in some way directly connected with the essential nature and constitution of all sorts of nerve-substance, whether cells or fibres." The first case clearly caused the two latter processes. I look on the gray degeneration, the thickened membranes, and bony plates, as pathologically exactly analogous to the optic neuritis, which is so frequent a result of tumours. The degeneration in the motor centres is especially interesting, as I am not aware that its occurrence has been pointed out as the result of the growth of a tumour in the brain. The second case was an admirable example of the irritation and ramollissement caused by certain rapidly-growing tumours and deposits.

In regard to the direct dependence of the symptoms during life on the tumours, I am not sure that in the first they could be referred to the tumour alone, but rather to it along with the series of distant pathological changes which it had set up (the degeneration, etc.). The tumour had most likely been slowly growing for years before there were any symptoms whatever.

The microscopic appearances found in and around the syphilomatous deposit are, I think, of great interest, as showing that it was in this instance thrown out amongst the brain-substance, destroying and disorganizing it (this no doubt corresponding to the irritation of the motor and mental functions during life); it then rapidly organized itself in a low form of cellular life, and it affected the arteries in every possible way by squeezing them, and so

[1] Journal of Mental Science, July 1872.

shutting them up, by thickening their coats; and, lastly, by getting inside them and developing there. This last mode of syphilitic affection of bloodvessels I am not aware of having seen described before.

The discussion of the tendency to apoplectic effusion, as seen in the quantities of blood-colouring matter to be found in every section of the tumour or the brain near it, would lead me into the very wide but most important question of the blood stasis that seems to take place in the capillaries of the brain in nearly all acute brain irritations and diseases—a question that I think has not had nearly enough attention directed to it, nor been at all sufficiently considered in relation to the pathology of these diseases.

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